



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,246	02/13/2002	Yoshimasa Iiduka	1081.1137	4438
21171	7590	01/18/2005	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005				ROSSOSHEK, YELENA
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/073,246	<b>Applicant(s)</b> IIDUKA ET AL.
	<b>Examiner</b> Helen Rossoshek	<b>Art Unit</b> 2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.  
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.  
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.  
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 26 October 2004.  
 2a) This action is **FINAL**.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-17 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 4,8,12 and 17 is/are allowed.  
 6) Claim(s) 1-3,5-7,9-11 and 13-16 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 13 February 2002 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6) <input type="checkbox"/> Other: _____.
--	--

## **DETAILED ACTION**

1. This office action is in response to the Application 10/073,246 filed 02/13/2002 and amendment filed 10/26/2004.
2. Claims 1-17 are pending in the Application. Claims 14-17 have been added to the Application.
3. Applicant's amendment has been fully considered. Examiner does not find them persuasive.

### ***Claim Objections***

4. Claims 1, 5 are objected to because of the following informalities:

Claim 1 line 6 after "into" delete "a-minus" insert –a minus—

Claim 1 line 7 after "data and" delete "a-minus" insert –a minus—

Claim 5 line 6 after "into" delete "a-minus" insert –a minus—

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 5-7, 9-11 and 13-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Futrell et al. (US Patent 6,238,824).

With respect to claims 1, 5, 9 and 14 Futrell et al. teaches an exposure method and apparatus which process an optical proximity correction to exposure pattern data and exposure a substrate in accordance with the bitmapping pattern data (col. 5, ll.24-30; col. 20, ll.41-49), comprising: converting the exposure pattern data into a minus objective pattern data and a minus pattern data, wherein an area corresponding to the minus pattern data is included in an area corresponding to the minus objective data as shown on the Fig. 3B the contacts (11) (exposure pattern) are one of the plurality of the initial reticle layouts (col. 5, ll.16-26) and subject to be corrected using OPC technique by adding the alignment budget borders (13) (converting into a minus objective pattern and minus pattern to be deleted from the minus objective pattern) as the correction area (12) shown on the Fig. 4 including the analysis of the difference between the circuit layout and the exposure pattern determining the area to be removed (minus patterns) from the area to be corrected (minus objective pattern) (col. 8, ll.64-67), wherein the method is performed by simulation software which is able to manipulate with image data (modify, update, delete) including verification and correction program (col. 9, ll.1-2; ll.6-9); generating the bitmapped pattern data by deleting the minus pattern data from the minus objective pattern data by subtracting areas (minus patterns) from initial reticle layout (corrected exposure pattern) after using first step of the OPC technique for close correspondence to the desired pattern (col. 3, ll.35-42; Fig. 5) wherein manipulations with image data are performed by simulation software (col. 9, ll.1-2); exposing the substrate in accordance with the bitmapped pattern data using OPC technique to generate one or more modified reticle layout portions, having this modified reticle layout

onto a resist, which will be exposed in a pattern including the features more closely approximate the corresponding features in the circuit layout (col. 7, II.14-19) working element-by-element (bitmapping) using simulation software which is able to verify and correct the data (modify, update, delete) (col. 9, II.13-18; II.19-21).

With respect to claims 2, 3, 6, 7, 10, 11, 15 and 16 Futrell et al. teaches in the case of the optical proximity correction for preventing corners of an exposed pattern on the substrate from being rounded, the exposure pattern data is converted into the minus objective pattern data which is an enlarged one of the exposure pattern data and into the minus pattern data positioned on sides of the area corresponding to the minus objective pattern data as shown on the Figs. 3B and 4 the exposure pattern (11) having the alignment budget borders (13) as an additional area for the pattern (11) to enlarge it (col. 7, II.54-56) creating the area (14) to be deleted (minus patterns) (col. 8, II.13-14), using the simulation software which is able to verify and correct the image (pattern) data (modify, update, delete) (col. 9, II.13-18; II.19-21); in the case of the optical proximity correction for preventing an enlargement at a position confronting an adjacent other pattern in a linear exposed pattern on the substrate, the exposure pattern data is converted into the minus objective pattern data consisting of the exposure pattern data and into the minus pattern data at a position confronting the adjacent other pattern by adding an alignment budget border around the outside of each reticle (enlargement) to be corrected, preferable to only one of each pair of adjacent reticle features by determined or calculated size (col. 7, II.35-37; II.43-46; 48-50) using the simulation

software which is able to verify and correct the image (pattern) data (modify, update, delete) (col. 9, II.13-18; II.19-21).

With respect to claims 13 Futrell et al. teaches an exposure apparatus for exposing a substrate in accordance with bitmapped pattern data (col. 20, II.41-44) comprising: a bitmap processing unit which inputs objective pattern data and a minus pattern data to be deleted from the minus objective pattern data, wherein an area corresponding to the minus pattern data is included in an area corresponding to the minus objective pattern data, and generates the bitmapped pattern data by deleting the minus pattern data from the minus objective pattern data by subtracting areas (minus patterns) from initial reticle layout (corrected exposure pattern) after using first step of the OPC technique for close correspondence to the desired pattern (col. 3, II.35-42; Fig. 5) wherein manipulations with image data are performed by simulation software (col. 9, II.1-2) an using processing unit (652) shown on the Fig. 7, wherein a computer system (650) is depicted which has an ability of using any suitable combination of computer compatible devices incorporated into the system (650) (col. 10, II.17-20; II.27-29); an exposure unit which exposes the substrate in accordance with the bitmapped pattern data using OPC technique to generate one or more modified reticle layout portions, having this modified reticle layout onto a resist, which will be exposed in a pattern including the features more closely approximate the corresponding features in the circuit layout (col. 7, II.14-19) working element-by-element (bitmapping) using simulation software which is able to verify and correct the data (modify, update, delete) (col. 9, II.13-18; II.19-21).

***Allowable Subject Matter***

7. Claims 4, 8, 12 and 17 are allowed. The prior art of record does not teach if a number of the divided exposure pattern data is expected to be less than that of the minus objective pattern data and the minus pattern data, an optional first step is processed (wherein the optional first step of correcting the exposure pattern data, and converting the corrected exposure pattern data into plural divided exposure pattern data), and wherein if a number of the minus objective pattern data and the minus pattern data is expected to be less than that of the divided exposure pattern data, an optional second step is processed (wherein the second step of converting the exposure pattern data into minus objective pattern data and minus pattern data, wherein an area corresponding to the minus pattern data is included in an area corresponding to the minus objective pattern data).

**Remarks**

8. Examiner maintains that Futrell et al. teaches the data corresponding to the areas of correction (exposure pattern data or minus objective pattern data) and to the area be deleted (minus pattern data) within using the simulating software which manipulates only with data (information) of the reticle design before a photolithography including suitable software to simulate, verify and modify (insert, update, delete) pattern data which performs the data integrity verification and correction analysis (col. 9, ll.1-2; ll.6-9; ll.19-29); generating the bitmapped pattern data by deleting the minus pattern data from the minus objective data such overlap is deleted from the correction area(s) to

form modified correction area(s) using system (650) shown on the Fig. 7 including processing unit CPU (652) (col. 5, ll.42-46; col. 10, ll.17-19; ll.29-31).

Based on these disclosures in Futrell et al., the rejection under 35 USC § 102 is maintained.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

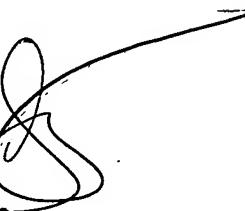
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen Rossoshek whose telephone number is 571-272-1905. The examiner can normally be reached on 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner  
Helen Rossoshek  
AU 2825

  
A. M. Thompson  
Primary Examiner  
Technology Center 2800